AMENDMENTS TO THE CLAIMS

1-112 (Cancelled).

113. (Previously Presented) A method of attaching monomers at specific reaction sites on a substrate, said specific reaction sites containing one or more non-photolabile protected initiating moieties, the method comprising:

a) contacting said substrate with a liquid solution comprising one or more photo-reagent precursors, said precursors selected from the group consisting of acid and base precursors, such that said liquid solution is in contact with said initiating moieties;

b) isolating said specific reaction sites;

c) irradiating a selected number of the isolated reaction sites to produce, in situ, at least one photo-generated reagent without the formation of a polymeric coating layer, thereby directly deprotecting the initiating moieties at the irradiated reaction sites so as to create deprotected initiating moieties; and

d) contacting said substrate with a first monomer, said first monomer comprising an unprotected reactive site and a protected reactive site, under conditions such that said unprotected reactive site of said monomer couples with said deprotected initiating moieties so as to create an attached first monomer.

114. (Previously Presented) The method of claim 113, wherein said initiating moieties of step (a) comprise linker molecules, each of said linker molecules comprising a reactive functional group protected by an acid-labile protecting group.

115. (Previously Presented) The method of claim 114, wherein said reactive functional group of said linker molecules comprises a hydroxyl group.

116. (Previously Presented) The method of claim 113, wherein said first monomer is selected from the group consisting of nucleophosphoramidites, nucleophosphonates and analogs thereof.

117. (Previously Presented) The method of claim 113, wherein said attached first monomer of step (d) comprises a nucleotide monomer with a protected group.

118. (Previously Presented) The method of claim 117, wherein said protected group is protected by an acid-labile group.

119. (Previously Presented) The method of claim 117, further comprising the step of deprotecting said protected group so as to create a deprotected attached nucleotide monomer.

120. (Previously Presented) The method of claim 119, further comprising the step of contacting said deprotected attached nucleotide monomer with a second monomer, said second monomer comprising an unprotected reactive site and a protected reactive group, under conditions such that said unprotected reactive site of said second monomer couples

with said deprotected attached nucleotide monomer so as to create an attached second monomer, said attached first and second monomers comprises a multimer.

121. (Previously Presented) The method of claim 120, wherein said multimer comprises DNA.

122. (Previously Presented) The method of claim 113, wherein said initiating moieties of step (a) comprise oligomers to which a monomer can be attached.

123. (New) An apparatus for generating a time and spatially dependent light spectrum comprising:

(a) a light source positioned to direct a light output, wherein said light source comprises a light that is redirected by a micromirror array under the control of a computer to produce said light output;

(b) a variable spectrum filter placed in the path of the light redirected by said light source, wherein said variable spectrum filter passes one or more spatially separated wavelengths of light; and

(c) said a computer controls the relative position of said variable spectrum filter and said light output.

124. (New) The apparatus of claim 123, wherein said computer controls the position of the variable spectrum filter in relation to the light source, wherein the light passed by the variable spectrum filter is time and wavelength controlled.

125. (New) The apparatus of claim 123, wherein said one or more spatially separated wavelengths of light are detected by a sensor that produces an output signal and the output signal of said sensor is directed to said computer, wherein said computer directs the position of the variable spectrum signal and said light source based on the output signal of said sensor.

126. (New) The apparatus of claim 123, wherein said light output is a UV light, visible or infrared light.

127. (New) The apparatus of claim 123, further comprising one or more lenses between said light source and a target, wherein one or more lenses are further defined as a lens system that may change the magnification of light in one or more dimensions reflected by said light source.

128. (New) The apparatus of claim 123, wherein said micromirror array is further defined as a two-dimensional micromirror array.

129. (New) The apparatus of claim 123, further comprising one or more diffusion

lenses between said light source and said micromirror array.

130. (New) The apparatus of claim 123, wherein said one or more wavelengths of light catalyze a reaction involving a light catalyzable compound proximate said target.

131. (New) The apparatus of claim 123, further comprising:

(a) a CCD camera positioned to receive light from said target to measure the intensity and wavelength of the light striking said target; and

(b) said computer connected to, controlling and receiving the output from said CCD camera.

132. (New) The apparatus of claim 123, wherein said light output is a combination of UV light, visible and infrared light.

133. (New) The apparatus of claim 123, wherein said one or more wavelengths of light interact with said target to produce the activation of one or more cellular functions at a site of the target.

134. (New) The apparatus of claim 123, wherein said one or more wavelengths of light catalyze the activation of one or more nucleotide bases at said target.

135. (New) The apparatus of claim 123, wherein said one or more wavelengths of light

catalyze the activation of a light catalyzable reaction involving one or more amino acid residue at said target.

136. (New) The apparatus of claim 123, wherein said one or more wavelengths of light crosslink a molecule proximate said target.

137. (New) An apparatus for projecting one or more wavelengths of light comprising:

(a) a light source positioned to redirect light from said light source toward a target, wherein said light source is further defined as comprising a light that produces one or more wavelengths of light that are redirected by a micromirror array under the control of a computer to produce said light;

(b) a variable spectrum generator positioned to pass one or more spatially separated wavelengths of light from said light source; and

(c) said computer connected to, and controlling, said light source and said variable spectrum generator to pass one or more wavelengths of light from said light source toward said target.

138. (New) The apparatus of claim 137, wherein said computer can control the position of the variable spectrum generator in relation to the light source, wherein the light passed by the variable spectrum generator is time and wavelength controlled.

139. (New) The apparatus of claim 137, wherein said one or more wavelengths of light

are detected at a sensor that produced an output signal and the output signal of said sensor is directed to said computer, wherein said computer directs the position of the variable spectrum generator and said light source based on the output signal of said sensor.

140. (New) The apparatus of claim 137, wherein said light that produces one or more spatially separated wavelengths is a xenon lamp, or a mercury lamp, or a laser or a combination thereof.

141. (New) The apparatus of claim 137, further comprising a total internal reflection mirror disposed in a position to redirect output of said light.

142. (New) The apparatus of claim 137, wherein said target is mounted and illuminated on a movable platform that is controlled via said computer to allow for multiple repetitive exposures of said target to said one or more spatially separated wavelengths of light passed by said variable spectrum generator.